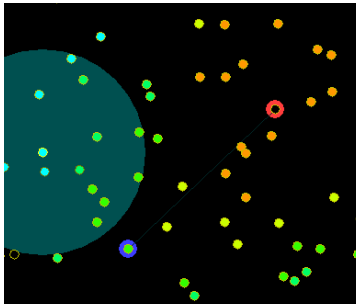
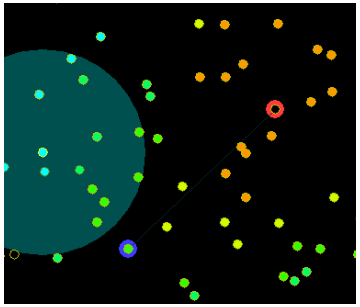


# Ember Corporation

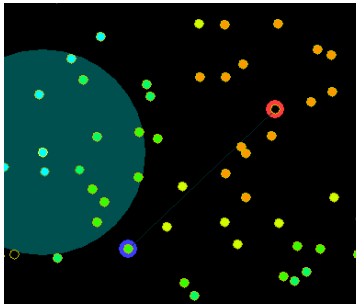
## Wireless Embedded Networking Systems

Robert Poor <r@ember.com>



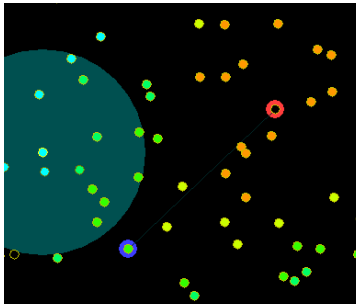
# What is Ember?

- **Ember is the wireless embedded networking company**.
- Ember provides low-cost, self-organizing communication networking technology to OEMs and System Integrators.
- Our initial focus is on ‘device oriented’ networks: simple to deploy; optimized for long-term, unattended operation; and which offer reliable connectivity even in challenging RF environments.

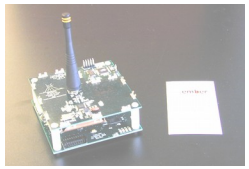
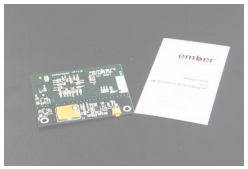


# Who is Ember?

- Funded August 2000 by Polaris Ventures, DFJNE, Stata Ventures, Bob Metcalfe
- Mgmt. Team: Adrian Tuck (CEO), Robert Poor (CTO), Andy Wheeler (Chief Scientist)
- 15 full time employees
- Initial push from MIT, SensIT, Media Lab sponsors



# A Brief History


| 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
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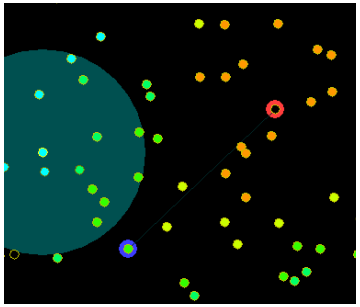
ember corporation



SENSIT

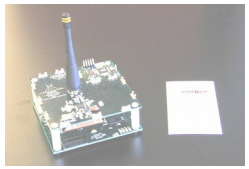


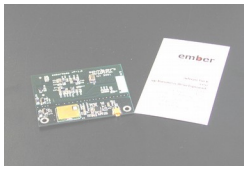
# A Brief History: 1997

**Biometric Monitoring**

82nd Airborne

MIT/USAIREM



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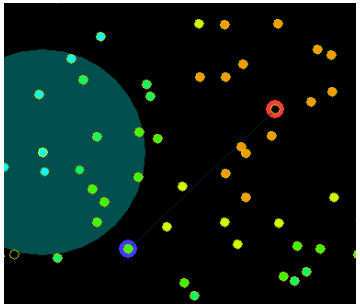
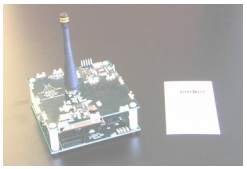
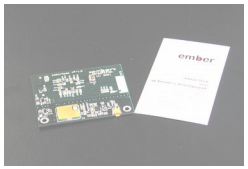


# A Brief History:1998

**Extreme Everest Expedition**

MIT/Yale/NASA



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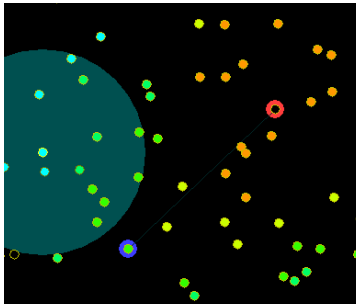

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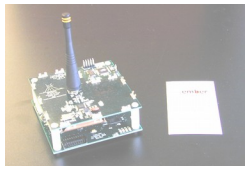

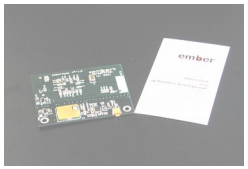


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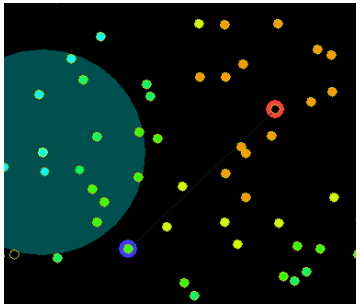
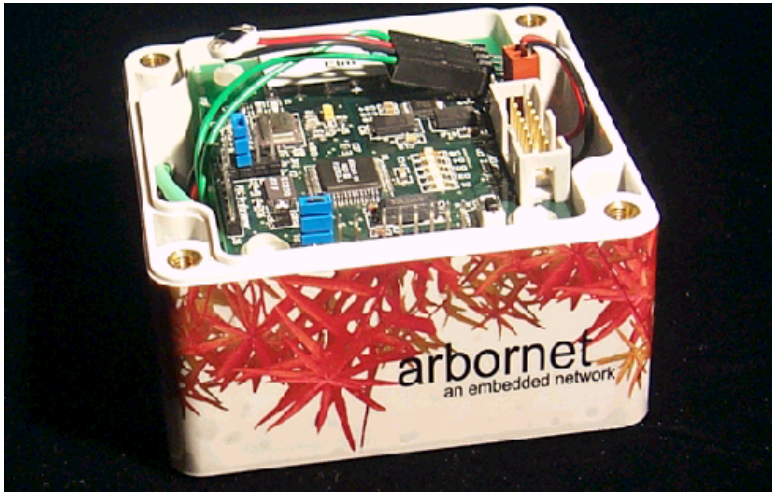


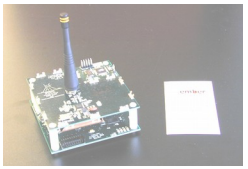
# A Brief History: 2000

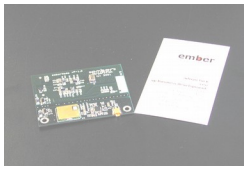



**Arbornet**

25 nodes, GRAd routing, TR1000 ASK radio

MIT / SensIT





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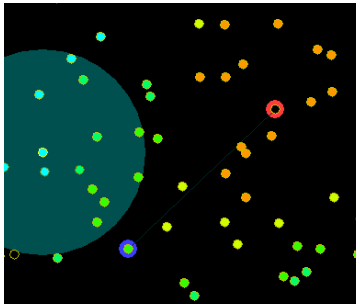

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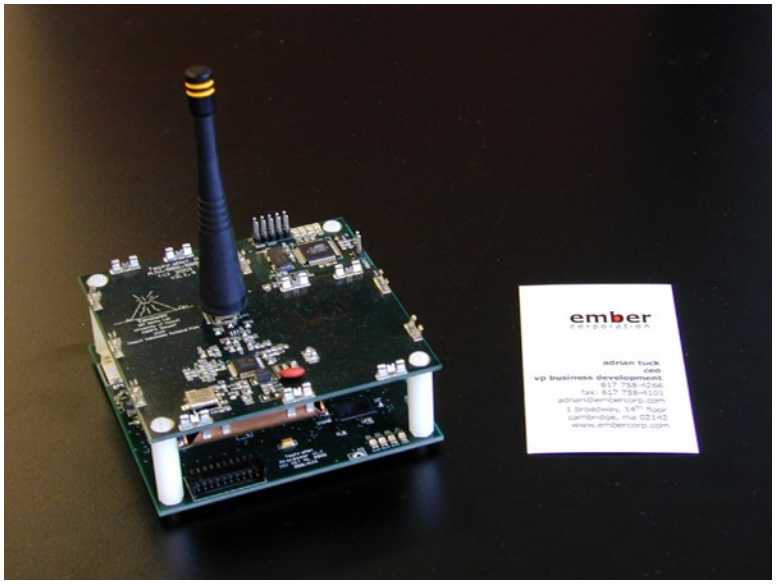
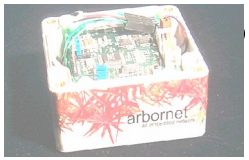
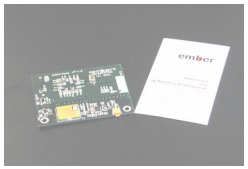



**TephraNet**

100 nodes, TI 915MHz FSK, Samsung ARM uP

MIT / U of HI / ensIT

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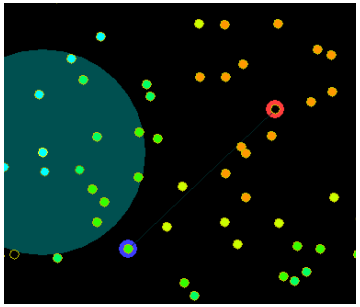


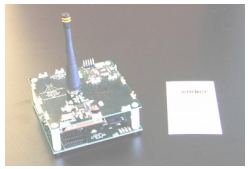
# A Brief History: 2002

**EmberNode**
v1

Atmel AVR uC,
915MHz DSSS,

EOS

Ember



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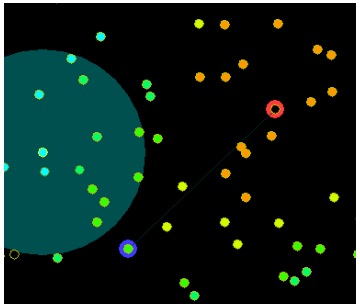
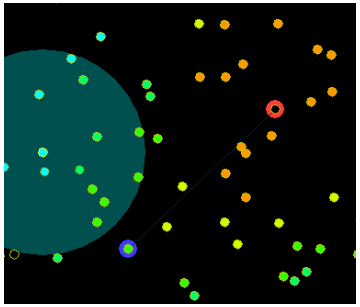


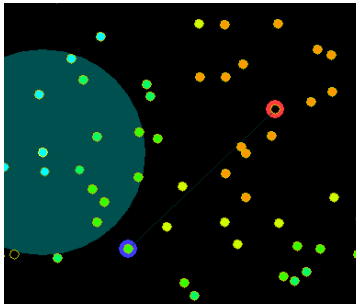
# Recent Results

- Funding (& staffing & customers).
- EOS: Concise API for service discovery, dynamic routing, LLC.
- Enhanced gradient routing algorithms; increased reliability
- Flexible service model: publish (push) or request (pull)
- Simulation: NS-2 for RF propagation and scheduling, but runs algorithms by emulating uController code in Linux processes



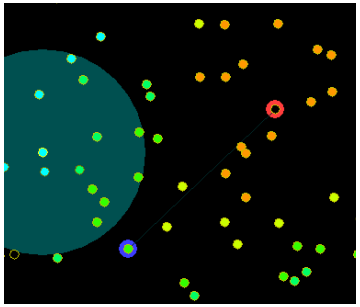
# Ember's Q2 Offerings

- EmberNode: 915 MHz DSSS, ATMEL AVR, 300 M (per hop) w/RF power control
- Gateway: 10BaseT
- EOS API & development tools
- Simulator
- Ethernet back-channel for monitoring and diagnostics
- Network Monitoring Software
- Reference Designs for OEMs



# Near-Term Work

- Validate Pilot deployments, launch Beta program
- Participating in four TSWG BAA proposals
- Implement power management
- Implement network-level encryption
- IEEE 802.15.4 Compliance



# Questions?

**Robert Poor <r@ember.com>**
**www.ember.com**